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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/783,875	02/20/2004	Christoph Schultheiss	K 224	7734

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EXAMINER	
CHORBAJI, MONZER R	

ART UNIT	PAPER NUMBER
1797	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/783,875	SCHULTHEISS, CHRISTOPH	
	Examiner	Art Unit	
	MONZER R. CHORBAJI	1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 April 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-9* is/are pending in the application.

4a) Of the above claim(s) *4-9* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *09 June 2008* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

This final action is in response to the amendment received on 4/20/09

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schoenbach (Bacterial Decontamination of Liquids with Pulsed Electric Fields) in view of Doevenspeck (U.S.P.N. 3,679,556).

Schoenbach discloses a method for the bacterial decontamination of, for example, milk or juices (milk is considered the processing liquid) having microorganisms (experimental results section on page 639) where pulsed electric fields are generated and applied to cause rupture of cell membranes (The effects of pulsed electric fields on biological cell section on page 638) using electroporation technique. The high electric fields are only generated between opposing electrodes having a capacitor and switch

(pulse shape section on page 640) during the discharge that are energized by a high voltage source as shown in figure 4 on page 640 where the duration of the applied electric field ranges from 1 ms to 50 ns (conclusion section on page 643). Schoenbach further teaches applying sequential electrical pulses (considered as preventing time-overlap) that are separated by 1 ms time intervals (pulse shape section on page 641) where one of ordinary skill in the art would readily recognize that the capacitor is recharged between sequential pulses. Furthermore, Schoenbach discloses a typical characteristic dimensions (considered the longitudinal axes Z of the cells of the process material) of 1micrometer for certain bacteria (right column of the effects of pulsed electric fields on biological cells section on page 638) that is momentarily present in the electroporation field of at most 1 microsecond (conclusion section on page 643).

As to the threshold potential difference equaling 10 V, Schoenbach recognizes that a 1 V potential across the outer membrane of a cell is necessary but insufficient to cause death by electroporation and further teaches that for pulses of submicrosecond duration, higher electric fields are required (right column of the effects of pulsed electric fields on biological cells section on page 638). One of ordinary skill in the art would recognize that for pulse durations of less than 1 microsecond, greater values of electric fields are required, which means higher values for electric field potential. It would have been obvious to one having ordinary skill in the art to determine, through routine experimentation, the length of pulse duration, strength of electric field which would produce the optimum pasteurization of organic process material. It would have been

obvious to one of ordinary skill in the art to use higher field strength (10V) and a shorter duration (1ms) in order to provide a quick pasteurization of material.

Schoenbach fails to teach whether the electrodes are arranged spaced from one another and normal or not to each other and does not teach if the device is flow through having electrodes distributed over a longitudinal area of the reactor where the bottom electrodes are grounded.

Doevenspeck discloses a flow through device (see device in figure 2 having inlet 10 and outlet 15) for sterilizing liquids using electric fields (col.1, lines 17-25) having high voltage positive and negative electrodes that are arranged spaced from one another on one side of the longitudinal passage from the reactor (see positive electrodes 14_1-14_5 and negative electrodes 13_1-13_6 as shown in figure 2) and are distributed in alternating positions (figure 2:14 and 13) so that a device that is simple in design is obtained that can be readily adapted to varying operational requirements by increasing or decreasing the number of cascades for achieving optimum efficiency (col.2, lines 53-58). The high voltage electrodes are distributed over one side of a longitudinal passage of the reactor (12) where the bottom electrodes (figure 2:13) are grounded (col.4, lines 43-45) and the electrodes are placed in alternating positions (see high voltage positive and negative carbon electrodes in figure 2) so that there are spaces between the grounded high voltage negative electrodes where opposite high voltage positive electrodes are positioned. The alternating high voltage positive electrodes (figure 2:14) are distributed in spaced relationship (positive electrodes 14 are positioned in a spaced relationship over negative electrodes 13 as shown in figure 2)

over an opposite side of the longitudinal flow passage (considered the unlabeled lengthwise of container 12 where fluid enters at inlet 19 and exits at outlet 15 as shown in figure 2) of the reactor where the high voltage positive electrodes (figure 2:14) are connected to the voltage source (col.4, lines 33-39 where the positive electrodes are considered the electrodes that generate the pulse) and the grounded high voltage negative electrodes (figure 2:13) in Doevenspeck are like the alternating electrodes in figure 2 of the specification where such a geometrical positioning of the electrodes results in having no electric fields axes that extend normal to the flow direction of any cell of the process material flowing through the longitudinal flow passage (considered the unlabeled lengthwise of container 12 where fluid enters at inlet 19 and exits at outlet 15 as shown in figure 2). It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the method in Schoenbach with the alternating electrodes so that a device that is simple in design is obtained that can be readily adapted to varying operational requirements by increasing or decreasing the number of cascades for achieving optimum efficiency as explained by Doevenspeck (col.2, lines 53-58).

4. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schoenbach (Bacterial Decontamination of Liquids with Pulsed Electric Fields) in view of Doevenspeck (U.S.P.N. 3,679,556) as applied to claim 1 and further in view of Mittal et al (U.S.P.N. 6,093,432).

Schoenbach and Doevenspeck do not teach values for the potential difference that is greater than or equal to 100 v. Mittal generates potential difference at 15 kV

(col.5, lines 1-4 and col.11, lines 14-17) in a treatment chamber containing apple cider, because this method provides no significant heating of the foodstuff or loss of natural vitamins and flavours (col.11, lines 27-31). It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the modified method in Schoenbach/Doevenspeck with the electric potential value of 15 kV, because such a potential results in having no significant heating of the foodstuff or loss of natural vitamins and flavors as explained by Mittal (col.11, lines 27-31), while providing adequate pasteurization of the food product.

5. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schoenbach (Bacterial Decontamination of Liquids with Pulsed Electric Fields in view of Doevenspeck (U.S.P.N. 3,679,556), Mittal et al (U.S.P.N. 6,093,432) as applied to claim 2 and further in view of Cheever (U.S.P.N. 4,305,000).

Schoenbach, Doevenspeck, and Mittal do not teach using Marx generator in connection with spark gap structures. Cheever sterilizes materials using an irradiation apparatus having Marx generator in connection with spark gap structures (col.4, lines 31-34 and col.5, lines 39-44), because such a device allows for a greatly increased range of voltage variation within which operation of the system is permissible (col.2, lines 36-39). As to the limitation that the voltage increase to the voltage maximum of at most 1 MV occurring not longer than 100 microseconds, Cheever considers electric-discharge pulses of the order of 100 to 500 KV as low energy that are generated over 50 to 150 nanoseconds (col.7, lines 2-7. For example, 50 nanosecond is much smaller time interval than 100 microseconds). One of ordinary skill in the art would readily

recognize that at a much longer time interval of 100 microseconds as claimed, Cheever's Marx generator produces a steep voltage increase of 1 MV. It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the modified method in Schoenbach/Doevenspeck/Mittal with the Marx generator, because such a device allows for a greatly increased range of voltage variation within which operation of the system is permissible as explained by Cheever (col.2, lines 36-39).

Response to Arguments

6. Applicant's arguments filed on 4/20/09 have been fully considered but they are not persuasive.

On pages 7-10 of the Remarks section; Applicant argues that the electrodes in the present invention do not extend into the flow passage through a reactor as is the case in the Doevenspeck reference; and that an electrode-free area is formed between the electrodes that are arranged on opposite sides of the reactor where this electrode structure results in no electroporation field lines or field line axis to extend normal to the flow direction of process material flowing through the longitudinal flow passage.

Doevenspeck discloses a flow through device for sterilizing liquids using electric fields having spaced positive and negative electrodes distributed in alternating positions along the opposite walls of container 12. In figure 2 of the Doevenspeck reference there are unlabeled electrode-free areas between the positive and the negative carbon electrodes, and the electrodes are distributed over a longitudinal area of the reactor where the bottom electrodes (13) are grounded. The alternating positive electrodes (14) and the grounded negative electrodes (13) in Doevenspeck are like the alternating

electrodes in figure 2 of the specification where such a geometrical positioning of the electrodes results in having no electric fields axes that extend normal to the longitudinal axis of the reactor.

Applicant in the instant claims and in the specification does not teach that the electrodes do not extend into the flow passage, however, the alternating positions of the spaced positive and grounded electrodes results in having no field lines that extend normal to the longitudinal flow direction of the process material.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

8. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to MONZER R. CHORBAJI whose telephone number is (571)272-1271. The examiner can normally be reached on M-F 9:00-5:30.

10. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill Warden can be reached on (571) 272-1267. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

11. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/M. R. C./

/Jill Warden/
Supervisory Patent Examiner, Art Unit 1797